

BEDSIDE MEDICINE FOR BEDSIDE DOCTORS

An Open Forum for brief discussions of the workaday problems of the bedside doctor. Suggestions of subjects for discussions invited.

RABIES: ITS PRESENT-DAY PROBLEMS*

I. THE CONTROL OF RABIES IN SOUTHERN CALIFORNIA

— GEORGE PARRISH, M. D. (2188 Live Oak Drive, Los Angeles).—The fundamental principles for the control of rabies in Southern California are about the same as they are in any other part of the country; making allowances for variations which occur with the differences in size of the many subdivisions and with the types of people and the extent of their education. Southern California, unfortunately, has the reputation of having more visionaries of more varieties running loose, than live in all the rest of America. These people appear and take part in public discussions, make false, vindictive and vicious statements, assassinate character by suggestion, treachery and innuendo. They are against everything that benefits mankind, especially if it has to do with medicine, and no amount of reasoning or evidence can or will convert them. They make claims and statements as truths which are devoid of reason or judgment, and which are not supported by the United States Public Health Service, or the state or local health departments. They are mavericks grazing in the pastures of ignorance and willing to remain there.

Relation of Sentiment and Emotionalism to Dogs and Rabies.

A medical authority says a dog has rabies; some childless, husbandless, dog-loving female says the authority is wrong, the dog is only suffering from mental worry, something that will not trouble her! The authority makes a scientific examination and verifies his diagnosis. A fanatic stands outside of the kennel, sees the dog having convulsions, hears its peculiar or characteristic howl and says "worms." She doesn't say whether she is referring to herself or the dog.

If they have ever read any authentic public health literature whatsoever they fail to show it. To them the Rockefeller Foundation is just a figure of speech, while Johns Hopkins is a character in mythology. In their learned discussions they quote among others Dr. Walter R. Haydon of England, a rabid "anti" on everything, who was tried for manslaughter because, in his ignorance of diphtheria, he permitted a child to die unnecessarily; Dr. William Collins, a favorite of theirs, wrote his learned discourses in 1881; Dr. Philip Ricord, was a really fine physician, but he wrote in 1867. They quote other doctors who practiced before the discoveries of Louis Pasteur enlightened us. Occasionally they repeat the words of some modern authority, but when they do, they resort to that time-worn trick of using just those

words that fit their purpose and in such a manner as to always distort the meaning which the writer intended to convey.

We are living in an age of exaggerated sentimentality, and this silly mental agitation is attempting to prevent proper means being taken for the promotion of human life. When a man or a woman gets to a point where he loves his dog more than he does his child, when he believes his dog should run at large without restraint and that the child should be locked up if it interferes with the liberty of his dog, then that person is only one jump behind the person who is already institutionalized. Citizens of this particular type have a peculiar social standing, and belong to no special sect, cult, religion or political faith. They are very clannish, avoid others and are shunned by the more educated people.

Unusual Conditions in Southern California.

The great majority of citizens residing in Southern California are fine, high-class, thoughtful persons; but, unfortunately, the reasonable, sane-thinking people—the majority—are too busy with their own private affairs and in making money, to devote any of their time to civic affairs; whereas the average fanatic has no private affairs, but attends to the business of everyone else.

The foregoing preamble is presented to show the type of persons and the obstacles the Southern California health departments have to meet and contend with.

Prevention of Rabies Not an Easy Problem.

The prevention of rabies is often a difficult, expensive and unsatisfactory procedure. On the one hand public health authorities are handicapped by the fact that rabies in human beings occurs infrequently and, consequently, there appears to be no urgent need for waging constant warfare against the malady; on the other hand, too many of the thinking public take too much for granted, believing they will be protected by public officials whether they take an interest or not. Coupled with these handicaps there are many dog owners who are wholly indifferent to the health and welfare of their neighbors.

If a child made a daily practice of running on his neighbor's lawn, tramping down the shrubbery, breaking the flowers and tearing up the grass, he would be soundly spanked and his parents would be called upon to pay the damages. He would probably be regarded as a problem child, and the social workers would be sitting on his doorstep; but these self-styled dog lovers fly into a rage if some regulation is suggested for the dog.

Statistical Data for Los Angeles.

The difficulties encountered in antirabic control can best be presented by means of statistical data. In the first place, Los Angeles has no ordinances

* In this issue, see press item on Rabies Problem in Santa Clara County, on page 67.

which apply to the control of the dog. The dog is monarch of all he surveys. He can tear off your arm or your child's leg, but nothing can be done about it, for he, under the law, is entitled to a second bite before action against him can be taken. A man may be charged with mayhem and put in jail if he bites a fellow who is beating him up; but he is only a man. Southern California needs a comprehensive and complete law which will take care of the dog throughout the year.

Suggestions Concerning Legal Provisions.

There should be at all times a systematic collection and elimination of all ownerless or stray dogs. No dog should be permitted on any public highway or in any public park unless on a leash, not exceeding six feet in length. A dog accompanied by his owner, if said owner is more than fifteen years of age, may run without leash provided the district is not under special dog quarantine. The owner of a dog, which, in violation of the law, is running at large and bites an individual, should be held legally responsible for all damages.

Any dog roaming at large without leash shall be picked up and taken to the pound. If licensed, the owner shall pay five dollars to reclaim him; if unlicensed, he shall pay for a license plus five dollars for failure to observe the law. There should be a graduated dog license fee. This should be \$2 a year for the male, and \$4 a year for the female dog, provided this fee is paid during the first three-month period during the year. One dollar extra should be added to this fee if it is not paid until the second quarter, making it \$3 for the male and \$5 for the female; another dollar should be added for failure to pay until the third quarter and still another dollar for the fourth quarter. This penalty imposed would not only cause owners to pay more promptly, but it would cause more worthless curs to be turned over to the authorities. The leash law would also help thin out the dog population.

People living in one room or in a small apartment in a crowded community, under these regulations, would soon tire of caring for their dogs and get rid of them. At present, most of these people only keep a dog because they do not have to pay any attention to him. They open the door at 6 a. m., the dog disappears until 6 p. m., and gets all his meals out of the neighbors' garbage cans.

Rôle of a Humane Animal Department.

In the collection of dogs the Humane Animal Department should make a monthly report to the state and local health officer covering his activities. In a rabies outbreak when a quarantine regulation has been declared by the state or local health officer, the agency which picks up and impounds the dogs should automatically pass under the directorship of the health officer until the quarantine is lifted. In my humble estimation, the state health officer, and he alone, should place a quarantine on dogs. In most instances he would do so at the request of the local health officer, or it would be done based on reports received by him. This regulation should be inviolate.

According to the United States Public Health Service, one of its most difficult obstacles to overcome in connection with public health is its in-

ability to get scientific and accurate facts to the people. Politics, prejudices and ignorance do much to sway public opinion and distort and mask the truth. The success of preventive medicine in eradicating any communicable disease depends ultimately on the public backing. Medical knowledge is useless unless the moral support of the community is strong enough to translate it into action.

To summarize.

In conclusion, city ordinances or state laws sufficiently strong should be drawn that will control any situation that arises provided they are enforced. The responsibility for bites should be placed squarely upon each dog owner. Moreover, a city should be reimbursed or fully compensated for its financial outlay in preventing human and canine rabies. There should be an all-year effort to rid the community of stray and unlicensed dogs.

The writer believes that each person bitten should receive compensation, whether the bite is provoked or unprovoked. A dog bite frequently involves pain, fright, torn clothing, a doctor's bill, and sometimes hospital treatment, and is a distressing experience. Moreover, a course of prophylactic injections is an ordeal, particularly for children. If the owners of biting dogs were sufficiently penalized, there would be a marked and rapid reduction in such occurrences. Occasionally, resorting to a shotgun quarantine is necessary and satisfactory: it immediately awakens the indifferent public to a sense of actual responsibility. In brief, it is a question of *Science vs. Ignorance—Sanity vs. Insanity*—of the *Majority Public vs. a Fanatical Few*.

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II. WHY WE HAVE RABIES IN OUR COMMUNITY, AND WHAT TO DO ABOUT IT

J. L. POMEROY, M. D. (330 North Broadway, Los Angeles).—It has been stated that, since 1922 up to 1937, we have had in California about 13,000 cases of rabies, and that California leads all other states in the number of such cases. It has been further stated that Los Angeles County heads the list of all counties in the State of California, having over 9,000 out of the total. It seems necessary to review some of the reasons why this situation exists, and what might be done about it.

Statistics for Los Angeles County.

During the last sixteen years our department [Los Angeles County Health Department], which covers about one-third of the total population of Los Angeles County, has averaged 210 positive heads per year. This means that there were approximately 356 positive heads for the remainder of Los Angeles County. From records in our department the first serious outbreak of rabies occurred in 1922-1923, with a maximum of about 850 cases. The disease dropped during the following four years to below 300 cases per year. It again rose to a new level of between 500 and 600 cases from 1928 to 1931, when it again fell for two years to nearly 300 cases per year. Beginning in 1932 it has climbed steadily, increasing each year until it reached 1,800 cases during the year 1937. During 1938, for the County Health De-

partment area, the disease reached a new peak of 26 positive heads during the fifth week. It has declined slowly until the twenty-fourth week, when there were 8 cases. During the past eighteen months there have been five human deaths in the entire county.

It can thus be seen that rabies is one of the more important communicable diseases in health department work. During 1937 nearly \$60,000 were expended in fighting this disease. There were 789 persons who received the Pasteur treatment, and over 2,000 individuals had their wounds cauterized with fuming nitric acid.

In numbers of cases handled during 1937, for comparison I give a list of certain other important contagious diseases, notably, diphtheria, 168 cases; influenza, 887; pneumonia, 547; syphilis, 924, and poliomyelitis, 53. There are few diseases communicable to man which have as their carrier an animal with four legs capable of traveling many miles, leaving here and there future foci through the animals it has bitten. Recently, for example, one dog in the course of its travels bit 11 licensed dogs, 3 unlicensed dogs, 1 bull, 4 cows, 21 goats and 5 persons.

Sources of Infection.

Various theories have been propounded as to sources of infection in California. I have heard it expressed many times during the past thirty years that a reservoir exists in the mountains of California, and domestic animals are constantly being infected from this so-called reservoir. Evidence shows, as recorded in the March 26, 1938 State Bulletin, that beginning in the early history of California to date, known cases of rabies have occurred among wild animals in California. At least this factor must be borne in mind. I cannot precisely evaluate the importance of this factor, but I am inclined to believe that in Los Angeles County it does not play a marked rôle. Nevertheless, it should not be ignored. I personally believe that the disease follows the well known biological rule of periodic increases in virulence with rapid spread. It is a well known fact that only about 16 per cent of human beings bitten would develop rabies, and surely with the fur-bearing animals the percentage is much less. And as to the question of carriers we have little knowledge indeed. So far there is no evidence to support the presumption that carriers exist in relation to rabies.

Another consideration that, in my opinion, is important in Southern California particularly is the tremendous tourist traffic, introducing dogs and other animals from all parts of the United States continually. For one reason or another many of these dogs become strays, and unquestionably do introduce rabies not infrequently into our territory.

Control Measures.

Various control measures have been recommended in the handling of rabies outbreaks, and during the last twenty-five years the following have been tried: control of the dog population by requiring an annual license; provision for the impounding and the humane destruction of all unlicensed dogs; and quarantine of all dogs in

areas where rabid animals have run at large. Muzzling has never been thoroughly tried in our county, although it has been attempted from time to time. The organization of a County Pound system was first attempted by the Board of Supervisors through contract with private humane animal societies. For various reasons which will be discussed later, this was abandoned approximately two years ago with the creation of a county poundmaster, who collected all stray and unlicensed dogs with his own men and trucks; but the county still continued to house the animals thus collected at private humane animal pounds. The destruction by shooting of all animals at large has never been done in Los Angeles County except during a concurrent hoof and mouth disease outbreak many years ago. Needless to say, rabies vanished within a very short time following the installation of this ruthless campaign. At least there is one rapid method of controlling rabies in the shooting of all dogs found at large during a quarantine.

Quarantine has been successful in the past in controlling relatively small isolated outbreaks. A few years ago in the district known as Belvedere a rigid quarantine was placed under order of the State Board of Health, and in a period of six weeks some 5,000 dogs were captured and destroyed. Rabies was wiped out very promptly.

Problems of Large Areas.

When we come to deal, however, with the situation where a county with a large city such as Los Angeles, likewise infected with rabies, cuts through the heart of the most populated area, the problem has different aspects. Physically, all of the forty-four cities in Los Angeles County are contiguous to the unincorporated areas, therefore epidemiologically, the entire county is the logical field for the spread of the disease as well as the enforcement of control measures. There is no doubt whatever that rabies has been endemic in Los Angeles City at least since 1921, and infected animals have acted as feeders to the remaining area in Los Angeles County.

The present quarantine was the result of the efforts made by Dr. George Parrish, health officer of Los Angeles City, and myself in the spring of 1938. We came to the conclusion that, to be effective, the quarantine must cover the major populated areas in the entire county. In spite of inherent difficulties in enforcement of any quarantine measures such as this is, the records show that, since the spring of the year and following the enforcement of the quarantine, rabies has declined. *It is possible* through a quarantine measure to stamp out rabies, but the measure will never succeed as effectively as it might if we had the hearty coöperation of the people.

Organized Opposition.

The chief reason, in my opinion, as to why we have rabies is that this disease and its resultant enforcement measures inevitably arouses an adverse emotional condition because it disturbs man's relationship with his pets, and because there are large numbers of persons actively engaged in and making a living out of the handling of pets, the

organizing of shows and all of the rest of the picture that accompanies this part of human life.

The first real obstacle encountered was an attempt through the courts to strike at the fundamental law. An injunction was obtained by a certain dog organization in Los Angeles which restrained the health officers from enforcing the law for a period of several weeks, during which time, of course, dogs were permitted their freedom. Fortunately for the case of public health, the court decided finally against the dog association, and for the cause of public health. This decision, which is an important one, has been published in a previous issue of this magazine. The attack was directed purely on the interpretation of the law, but it is important to bear in mind that the organization which fostered the attack believes that the licensed dog should be exempt from any quarantine measure. The Court held that: "It is true that dogs are property; that the owners have a property right therein but, like other property, they must be kept by their owners in such a manner that they will not become a menace to other animals or to human beings."

It is important to review the extent locally of the opposition, the effect of which is that rabies may not be stamped out in Southern California. In the first place, there is the natural lack of a sense of conviction of the real danger to any individual concerning rabies. After all, in a large population comparatively few people see a rabid dog, and hence lack personal experience. Furthermore, by comparison, deaths from automobile accidents and other causes are so much greater and so common that it is difficult with many citizens to convince them of the necessity of keeping their particular dog under control. Again, we are to a certain extent to blame because of a lack of an adequate system of education of the public in matters of this kind. I have been amazed to discover the fact that a great many people know little concerning the disease rabies. It is quite apparent that California as a whole lacks a real constructive system of health education in our public school system. Until this is accomplished, health departments can do little. Education in the humane treatment of animals is a byword among school children, but education in communicable diseases is, in my opinion, to a large measure ineffective throughout the state, at least in relation to animal diseases.

Then we have a group called the Antivivisectionists, who are most vehement and most aggressive in their interest to protect dogs and other animals. However, in regard to rabies it is interesting to note that this opposition has softened very considerably in regard to our recent rabies control measures.

Next is a large group which, under the name of Humane Societies, is really interested in the matter from a business standpoint—the impounding and sale of animals. Coupled with this is the group of pet shops and similar organizations whose business is disturbed by any quarantine order.

Recognizing the peculiar emotional reaction which is bound to result in serious opposition in quarantine measures in handling rabies, the writer believes that, as a public policy, the present quarantine in Los Angeles County should not be lifted

until local ordinances are made permanent relative to curbing the past freedom enjoyed by the dog.

Author's Suggestions.

We propose the following program:

1. A permanent campaign rigorously enforced in relation to picking up stray dogs.
2. A permanent ordinance requiring dogs at large off the owner's property to be only on a leash.
3. Research looking for a more effective vaccine against rabies, as well as efforts to standardize the effectiveness of the present material used for Pasteur treatment to make sure that it is potent.
4. Educational efforts, particularly among the younger group of people throughout the county.

In Conclusion:

It is the current belief in our department that only through the development of a really efficient protective vaccine against rabies can a material advance in the method of handling this disease be developed. Further, we believe that the State or Federal Government should standardize the effectiveness of the present material on the market in common use for the administration of the Pasteur treatment, to make sure that a potent material is available. Also, we believe that the present state law known as the Rabies Act should be modified and brought up-to-date, as certain aspects of this law are not working properly.

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III. IS RABIES TRANSMITTED THROUGH MILK?*

K. F. MEYER, M. D. (George Williams Hooper Foundation, University of California, San Francisco).—It is a well known fact that rabies may be conveyed to herbivorous animals through the bite of rabid dogs, wolves or coyotes. Reports on the epidemic distribution of this disease in herds of cattle are by no means infrequent. Occasionally, milk secreted by a cow, which subsequently is proved to have suffered from rabies, is offered for sale and is consumed raw by a large clientele of the dairy. One is then confronted with the pertinent question: Should the individuals who have ingested the milk be subject to antirabic treatment? A critical evaluation of the available information, in the light of newer knowledge and the formulation of a definite answer, appears imperative. To begin with, it is noteworthy that the views relative to the infectiousness of milk derived from rabid animals have, in the course of years, undergone a number of changes.

Comments on the Literature.

At the beginning of the nineteenth century, the prevailing views concerning the harmfulness of milk derived from rabid animals were changed, when numerous feeding experiments yielded negative results. *Moreover, a careful perusal of the available literature failed, and has failed to record a single case of human rabies which has conclusively followed the ingestion of milk from a rabid cow or animal.* The extensive and fundamental researches by Pasteur and his associates, however, furnished proof that the virus, although present in a concentrated amount in the central nervous

* From the George Williams Hooper Foundation, University of California, San Francisco.

system, may be found in certain glands and their secretions. In particular, the salivary and the lacrimal glands, the pancreas and, occasionally, the mammary glands may contain the infective agent. Furthermore, it must be recalled that, just as in foot and mouth disease, the virus may be accidentally transferred and mixed into the milk after it has been collected from the udder, the hands of the milker soiled with the saliva may contaminate the milk. In the classical treatise on rabies (*Traité de la rage*, 1912, page 270), Babes lists the experiments of Nocard, who found that one of four specimens of milk collected from a rabid dog produced typical rabies when inoculated into a rabbit. On the other hand, Roux made the significant observation that he transmitted rabies to the experimental animals only on one occasion, when he mixed the milk of an infected rabbit with a fragment of the mammary gland, while the secretion gently collected from the organ was noninfectious. Bardach (*Ann. de l'Inst. Pasteur*, 1887, page 180) proved the presence of the virus in the milk of a woman suffering from rabies both before and after death by testing the secretion on rabbits and guinea pigs. The nursling of this woman consumed this milk until the last day before death of the mother without showing any detrimental effects. These positive findings are contrasted by the extensive experiments of Nicolas (*Jour. méd. vétérinaire et de Zoologie*, Dec. 31, 1905, page 721), who tested the milk of rabid herbivores, and experimented with animals having received highly infectious material intravenously. Since the milk failed to become infectious, he concluded that the rabies virus is not passed into the mammary secretion from the blood. No rabies virus was detected in the lacteal fluid of a rabid sheep in the careful studies described by Repetto (*Riforma med.*, Dec. 14, 1907). More recent studies have yielded essentially the same results. Mugrage (*Jour. Lab. and Clin. Med.*, 1920-1930, 15, page 460) observed a puppy which had fed on a rabid bitch. The animal developed normally. In experiments on rabbits, he was unable to demonstrate any virus in the milk of the diseased rodents. Probably the most convincing series of tests were conducted by Remlinger and Bailly (*Compt. rend. Soc. de biol.*, 1932, 110, page 239 and *Ann. de l'Inst. Pasteur*, 1932, 40, page 730), who tested the milk of seven rabid guinea pigs, four cats and one dog. In thirty-nine inoculations of milk, only one sample removed from a moribund guinea pig proved infectious. One specimen of mammary gland removed from a dead guinea pig carried the virus. The latter result was anticipated, since the peripheral nerve tissues are known to be the conductors of the rabies virus. Mechanical injuries leading to tears in the glandular structures of the udder may encourage admixtures of the virus to the milk. From the experimental studies one must conclude that *the milk of rabid animals contains the virus only under exceptional conditions.*

More Recent Observations.

A study of the literature presents no data to prove the presence of the rabies virus in cows' milk. The majority of recent investigators are convinced that, as a rule, a number of additional

factors contribute to the protection of the public from consuming infected milk. At a time when the secretion may under exceptional circumstances carry the virus, although it has never been proven for cattle, usually the milk flow has dropped off tremendously; the symptoms of rabies are sufficiently definite to warn the dairyman that the cow is sick and the milk probably harmful. Pasteurization promptly destroys the virus. However, there is always the possibility that the accidental contamination of the milk with the saliva of the rabid animal or other extraneous sources may render the food product infectious. If, on inquiry, the statements of the milker remotely suggest such a possibility, one is confronted with another question: Does the rabies virus pass through the intact mucous membrane of the buccal cavity and the intestinal tract? Experimental studies, which date back to the early studies on rabies, leave little doubt that the intestinal canal is not a suitable portal of entry for the rabies virus. Feeding experiments by Hertwig, Delafond, Renauld and, in particular, Nocard were uniformly unsuccessful. That the intact mucous membrane is not permeable was well illustrated by a critical experiment of Nocard (*Les maladies microbiennes des animaux*, Paris, 1903, 2, page 465). He fed a fox the highly infectious brain material from six foxes and several dogs which had succumbed to rabies. The animal remained well. On the other hand, Galtier succeeded in four instances of thirty attempts to infect rabbits in which the mucous membrane of the buccal cavity had been rubbed with highly infectious brain material. In the light of the present-day views on the pathways of infection, it is obvious that the accidental exposure of a nerve ending by trauma (rubbing of mucous membrane) may create a suitable portal of entry for the virus. The intact mucous membrane may thus permit the passage of the rabies virus. Superficial defects on the mucosa of the mouth and gums, or fissures and cuts on the lips, tongue or upper digestive tract could possibly serve as such avenues of infection. Disturbances in the gastrointestinal tube or inadequate gastric secretion which ordinarily destroys the virus (0.01 per cent hydrochloric acid at 37 degrees centigrade in two hours) may reduce or entirely inhibit the protection against rabies by ingestion. Despite these arguments for a possible gastrointestinal entry of the virus, there must be recorded convincing epidemiologic evidence against this probability. The meat of emergency-slaughtered animals, rabid cattle and hogs has been eaten by large groups of people without any consequences. Even the cadavers of rabid dogs have not escaped this fate. In not one instance have harmful effects been noted (Joseph Koch).

To Summarize.

In conclusion, it may be stated that the scientific data do not seem to justify the antirabic treatment for individuals who have ingested the clean raw milk from a rabid cow. On the other hand, if contamination of the milk with saliva is within the realm of probability, and the milk has not been pasteurized, the physician should weigh carefully the institution of Pasteurian treatment.